

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A reflective liquid crystal display (LCD) apparatus comprising:

a transparent first substrate;

a transparent electrode arranged on the first substrate;

a second substrate;

a switching element arranged on the second substrate;

an insulation film arranged on the switching element and having a convex/concave structure;

a reflection electrode arranged on the insulating film along the convex/concave structure

and connected to the switching element; and

a liquid crystal layer sandwiched between the transparent electrode of the first substrate and the reflection electrode of the second substrate; wherein

the insulation film protects the switching element ~~after formed~~;

~~and~~ the convex/concave structure is formed by irregular arrangement of regions having different thickness values; and

at least one portion of the insulation film is a single material that extends laterally along the second substrate under the entirety of at least two adjacent convex portions of the convex/concave structure, and

the at least one portion of the insulation film has, along its length, a generally constant thickness extending at least from an uppermost surface of the second substrate to a lowermost surface of a concave portion of the convex/concave structure located between the at least two adjacent convex portions.

2. (Original) The reflective LCD apparatus as claimed in Claim 1, wherein the convex/concave structure has a continuous smooth shape.
3. (Original) The reflective LCD apparatus as claimed in Claim 1, wherein the insulation film is a single-layered film made from a single material.
4. (Original) The reflective LCD apparatus as claimed in Claim 1, wherein the insulation film has a light absorption characteristic.
5. (Original) The reflective LCD apparatus as claimed in Claim 1, wherein the convex/concave structure has a plurality of protrusions arranged irregularly.

6. (Original) The reflective LCD apparatus as claimed in Claim 5, wherein the protrusions have an island shape or a line shape in a plan view.

7. (Original) The reflective LCD apparatus as claimed in Claim 1, wherein the convex/concave structure has a plurality of indentations arranged irregularly.

8. (Original) The reflective LCD apparatus as claimed in Claim 7, wherein the indentations have a hole shape or a line shape in a plan view.

9. (Original) The reflective LCD apparatus as claimed in Claim 1, wherein the convex/concave structure is formed by repetition of an irregular convex/concave shape based on one or more than one pixels.

10. (Original) The reflective LCD apparatus as claimed in Claim 1, wherein the insulation film is made from an organic resin or inorganic resin having photosensitivity.

~~11. through 15. (Cancelled)~~

16. (Currently Amended) A liquid crystal display (LCD) apparatus comprising:
a pair of a first substrate and a second substrate, each of which is transparent and is separately arranged so as to have a predetermined distance between each other;

a transparent electrode arranged on the first substrate;

a switching element arranged on the second substrate;

an insulation film which is arranged on the second substrate in a continuous face shape and arranged on an upper part of the switching element so as to protect the switching element by overlaying the same, ~~and has~~ having a convex/concave structure on a surface facing the first substrate;

a reflection electrode which is arranged on the insulation film and a surface of which, facing the first substrate, has a shape reflecting the convex/concave structure of the insulation film; and

a liquid crystal layer filled in a space between the transparent electrode of the first substrate and the reflection electrode of the second substrate, wherein

at least one portion of the insulation film is a single material that extends laterally along the second substrate under the entirety of at least two adjacent convex portions of the convex/concave structure, and

the at least one portion of the insulation film has, along its length, a generally constant thickness extending at least from an uppermost surface of the second substrate to a lowermost surface of a concave portion of the convex/concave structure located between the at least two adjacent convex portions.

17. (Previously Presented) The LCD apparatus as claimed in Claim 16, wherein the insulation film is a single layer structure and has the convex/concave structure formed as a part of the surface, facing the first substrate, of the insulation film.

18. (Previously Presented) The LCD apparatus as claimed in Claim 17, wherein a protrusion of the convex/concave structure is a continuous smooth shape.

19. (Previously Presented) The LCD apparatus as claimed in Claim 17, wherein the insulation film has a light absorption characteristic.

20. (Previously Presented) The LCD apparatus as claimed in Claim 17, wherein a plurality of protrusions of the convex/concave structure and a plurality of indentations indented downward from the protrusions are arranged irregularly.

21. (Previously Presented) The LCD apparatus as claimed in Claim 20, wherein the protrusions have a pattern of an island-shape or a line shape.

22. (Previously Presented) The LCD apparatus as claimed in Claim 20, wherein the indentations have a pattern of a hole shape or a line shape.

23. (Previously Presented) The LCD apparatus as claimed in Claim 20, wherein the convex/concave structure is formed by an irregular arrangement of the convex/concave shape based on one pixel or more than one pixels as a unit.

24. (Previously Presented) The LCD apparatus as claimed in Claim 17, wherein the insulation film. is made from an organic resin or inorganic resin having photosensitivity.

25. (Previously Presented) The LCD apparatus as claimed in Claim 16, wherein the insulation film is a single layer structure and has the convex/concave structure formed separately on the surface, facing the first substrate, of the insulation film.

26. (Previously Presented) The LCD apparatus as claimed in Claim 25, wherein the insulation film has a light absorption characteristic.

27. (Previously Presented) The LCD apparatus as claimed in Claim 25, wherein a plurality of protrusions of the convex/concave structure and a plurality of indentations indented downward from the protrusions are arranged irregularly.

28. (Previously Presented) The LCD apparatus as claimed in Claim 25, wherein the protrusions have a pattern of an island shape or a line shape.

29. (Previously Presented) The LCD apparatus as claimed in Claim 25, wherein the indentations have a pattern of a hole shape or a line shape.

30. (Previously Presented) The LCD apparatus as claimed in Claim 25, wherein the convex/concave structure is formed by an irregular arrangement of the convex/concave shape based on one pixel or more than one pixels as a unit.

31. (Previously Presented) The LCD apparatus as claimed in Claim 25, wherein the insulation film is made from an organic resin or inorganic resin having photosensitivity.

32. (Previously Presented) The LCD apparatus as claimed in Claim 25, wherein the insulation film is formed of a transparent photosensitive material where a back light is able to pass through.

33. through 48. (Cancelled)

49. (New) The reflective LCD apparatus as claimed in Claim 1, wherein said at least one portion of said insulation film also comprises a portion that extends to be arranged on top of said switching element.

50. (New) The liquid crystal display (LCD) apparatus as claimed in Claim 16, wherein said at least one portion of said insulation film also comprises a portion that extends to be arranged on top of said switching element.

51. (New) A reflective liquid crystal display (LCD) apparatus comprising:
a transparent first substrate;
a transparent electrode arranged on the first substrate;
a second substrate;
a switching element arranged on the second substrate;
an insulation film arranged on the switching element and having a convex/concave structure;
a reflection electrode arranged on the insulating film along the convex/concave structure and connected to the switching element; and
a liquid crystal layer sandwiched between the transparent electrode of the first substrate and the reflection electrode of the second substrate; wherein
the insulation film protects the switching element;
the convex/concave structure is formed by irregular arrangement of regions having different thickness values; and
the insulation film is a single-layered film made from a single material.

52. (New) A liquid crystal display (LCD) apparatus comprising:

a pair of a first substrate and a second substrate, each of which is transparent and is separately arranged so as to have a predetermined distance between each other;

a transparent electrode arranged on the first substrate;

a switching element arranged on the second substrate;

an insulation film which is arranged on the second substrate in a continuous face shape and arranged on an upper part of the switching element so as to protect the switching element by overlaying the same, and has a convex/concave structure on a surface facing the first substrate;

a reflection electrode which is arranged on the insulation film and a surface of which, facing the first substrate, has a shape reflecting the convex/concave structure of the insulation film; and

a liquid crystal layer filled in a space between the transparent electrode of the first substrate and the reflection electrode of the second substrate,

wherein the insulation film is a single layer structure and has the convex/concave structure formed as a part of the surface, facing the first substrate, of the insulation film.

53. (New) A reflective liquid crystal display (LCD) apparatus comprising:

a transparent first substrate;

a transparent electrode arranged on the first substrate;

a second substrate;

a switching element arranged on the second substrate;

an insulation film arranged on the switching element and having a convex/concave structure;

a reflection electrode arranged on the insulating film along the convex/concave structure and connected to the switching element; and

a liquid crystal layer sandwiched between the transparent electrode of the first substrate and the reflection electrode of the second substrate; wherein

the insulation film protects the switching element;

the convex/concave structure is formed by irregular arrangement of regions having different thickness values; and

the entire insulation film between said reflection electrode and said second substrate is a single-layered film made from a single material arranged in one step.

54. (New) A liquid crystal display (LCD) apparatus comprising:

a pair of a first substrate and a second substrate, each of which is transparent and is separately arranged so as to have a predetermined distance between each other;

a transparent electrode arranged on the first substrate;

a switching element arranged on the second substrate;

an insulation film which is arranged on the second substrate in a continuous face shape and arranged on an upper part of the switching element so as to protect the switching element by overlaying the same, and has a convex/concave structure on a surface facing the first substrate;

a reflection electrode which is arranged on the insulation film and a surface of which, facing the first substrate, has a shape reflecting the convex/concave structure of the insulation film; and

a liquid crystal layer filled in a space between the transparent electrode of the first substrate and the reflection electrode of the second substrate,

wherein the entire insulation film between said reflection electrode and said second substrate is made from a single material arranged in a single step and has the convex/concave structure formed as a part of the surface, facing the first substrate, of the insulation film.

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